

WHAT IS CLAIMED IS:

1. An RF module comprising;
a multi-layered substrate;
a base-band IC, a memory IC and an RF-IC mounted on
said multi-layered substrate;
an RF passive component incorporated in said multi-layered substrate; and
a wiring pattern incorporated in said multi-layered substrate, said wiring pattern interconnecting said base-band IC and said memory IC.
2. An RF module according to Claim 1, further comprising an antenna incorporated in said multi-layered substrate.
3. An RF module according to Claim 1, wherein at least one of said base-band IC, said memory IC and said RF-IC is a bare chip.
4. An RF module according to Claim 3, wherein at least one cavity is formed in a portion of said multi-layered substrate, and said bare chip is disposed in said at least one cavity.

5. An RF module according to Claim 1, wherein said base-band IC and said memory IC are mounted on a first side of said multi-layered substrate, and said RF-IC is mounted on a second side of said multi-layered substrate.

6. An RF module according to Claim 5, further comprising a shielding ground electrode pattern interposed between the first side of said multi-layered substrate on which said base-band IC and said memory IC are mounted and said RF passive component incorporated in said multi-layered substrate.

7. An RF module according to Claim 1, further comprising at least one trimming electrode pattern disposed on a surface of said multi-layered substrate and arranged to enable adjustment of frequency characteristics of the RF module.

8. An RF module according to Claim 4, wherein said RF-IC is a bare chip, said RF module further comprising:

a ground pattern arranged to prevent RF signal radiation provided within said multi-layered substrate at a location on the bottom surface of said bare chip, so as to prevent unnecessary radiation of RF signals from said RF-IC; and

a plurality of via holes arranged within said multi-layered substrate and around said bare chip, said via holes providing connection to said ground electrode pattern for preventing RF signal radiation.

9. An RF module according to Claim 1, further comprising a metallic case disposed on said multi-layered substrate.

10. An RF module according to Claim 9, wherein the metallic case is arranged to define a portion of an antenna.

11. An RF module comprising;
a substrate;
a plurality of different electronic components mounted on said substrate;

an RF passive component incorporated in said substrate; and

a wiring pattern incorporated in said multi-layered substrate, said wiring pattern interconnecting at least two of said IC components.

12. An RF module according to Claim 11, wherein the substrate is a multi-layered substrate 12 made of ceramic material.

13. An RF module according to Claim 11, wherein the plurality of electronic components include a base-band IC, a memory IC, a quartz oscillator and surface-mounted components.

14. An RF module according to Claim 13, wherein the surface mounted components includes at least one of a chip-type inductor, a chip-type capacitor, a chip resistor, a chip-type transistor, and a chip-type diode.

15. An RF module according to Claim 11, further comprising a metallic case disposed on said substrate.

16. An RF module according to Claim 11, wherein the metallic case is arranged to define a portion of an antenna.

17. An RF module according to Claim 11, wherein at least one cavity is formed in a portion of said substrate, and at least one RF-IC is disposed in said at least one cavity.

18. An RF module according to Claim 11, further comprising an antenna incorporated in said substrate.

19. An RF module according to Claim 13, wherein at least one of said base-band IC, said memory IC and said RF-IC is a bare chip.

20. An RF module according to Claim 19, wherein at least one cavity is formed in a portion of said substrate, and said bare chip is disposed in said at least one cavity.

21. An RF module according to Claim 13, wherein said base-band IC and said memory IC are mounted on a first side of said substrate, and said RF-IC is mounted on a second side of said multi-layered substrate.

22. An RF module according to Claim 21, further comprising a shielding ground electrode pattern interposed between the first side of said substrate on which said base-band IC and said memory IC are mounted and said RF passive component incorporated in said substrate.

23. An RF module according to Claim 13, further comprising at least one trimming electrode pattern disposed on a surface of said substrate and arranged to enable adjustment of frequency characteristics of the RF module.

24. An RF module according to Claim 23, wherein said

RF-IC is a bare chip, said RF module further comprising:

a ground pattern arranged to prevent RF signal radiation provided within said substrate at a location on the bottom surface of said bare chip, so as to prevent unnecessary radiation of RF signals from said RF-IC; and

a plurality of via holes arranged within said substrate and around said bare chip, said via holes providing connection to said ground electrode pattern for preventing RF signal radiation.

RF-IC is a bare chip, said RF module further comprising: